UNITED STATES PATENT AND TRADEMARK OFFICE

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EXAMINER
COLAN, GIOVANNA B

ART UNIT	PAPER NUMBER
2162	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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		Application No.	Applicant(s)
Office Action Summary		10/758,370	BARGERON ET AL.
		Examiner	**Art Unit**	
		Giovanna Colan	2162	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-42* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

1.   This action is issued in response to applicant filed request for continued

examination (RCE) on 07/18/2007.

2.   Claims 1, 3 – 4, 23 – 26, 33, 38 – 40, and 42 have been amended. No claims

were added. No claims were canceled.

3.   Claims 1 – 42 are pending in this application.

Response to Arguments

Applicant's arguments with respect to amended claims 1, 3 – 4, 23 – 26, 33, 38 –

40, and 42 have been considered but are moot in view of the new ground(s) of rejection.

Continued Examination Under 37 CFR 1.114

4.   A request for continued examination under 37 CFR 1.114, including the fee set

forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this

application is eligible for continued examination under 37 CFR 1.114, and the fee set

forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action

has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on

10/11/2006 has been entered.

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

6.   This application currently names joint inventors. In considering patentability of

the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g)

prior art under 35 U.S.C. 103(a).

7.   Claims 1 – 4, 7 – 9, 11 – 12, 19 – 22, 25 – 26, 33 – 36, 38 – 40, and 42 are

rejected under 35 U.S.C. 103(a) as being unpatentable over Zhao (US Patent No.

6,487,301 B1, issued: November 26, 2004), in view of Lienhart et al. (Lienhart

hereinafter) (US 6,470,094), and further in view of Hale et al. (Hale hereinafter) (US

6,928,548).

Regarding Claim 1, Zhao discloses a system for document retrieval and/or indexing comprising:

a component that receives a captured image of at least a portion of a physical document (Col. 4, and 7, lines 20 – 22 and 33 – 36, and 25 – 35; respectively, "receives the digital representation", Zhao[1]);

a search component that locates a match to the document (Col. 4, lines 44 – 47, "the first digital document is searched..", Zhao), the search is performed over word-level topological properties of generated images (Col. 4, lines 45 – 47, "search to find the confusing alphanumeric characters and a character string ...", Zhao), the generated images being images of at least a portion of one or more electronic documents (Col. 4, lines 6 – 10, Zhao).

Zhao also discloses width of words (Col. 4, lines 49 – 52, Zhao[2]). However, Zhao is silent with respect to that such word-level topological properties comprise at least respective widths of words on the generated images. On the other hand, Lienhart discloses a system and method similar to the one of Zhao including word-level topological properties comprise at least respective widths of words on the generated images (Col. 10, lines 6 – 15, Lienhart). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the Lienhart's teachings to the system of Zhao. Skilled artisan would have been motivated to do so, as suggested by Lienhart (Col. 10, lines 13 – 14, Lienhart), to reduce the complexity and later enable a more stable text tracking throughout time.

The combination of Zhao in view of Lienhart also discloses a comparison
component that compare signatures associated with captured image with signatures
associated with generated images (Col. 5, lines 51 – 65, Zhao). However, the
combination of Zhao in view of Lienhart does not explicitly disclose the details of such
comparison, such as: iteratively comparing a portion of a signature associated with the
captured image with portions of signatures respectively associated with the generated
images. On the other hand, Hale discloses: a comparison component that iteratively
compares a portion of a signature associated with the captured image with portions of
signatures respectively associated with the generated images and excludes each
generated image whose portions of the signature does not match the portion of the
signature of the captured image, the portion of the signature associated with the
captured image and the portion of the signatures respectively associated with the
generated images that are compared become progressively smaller with each iteration,
where one or more iterations are performed until a predetermined threshold number of
generated images remain (Fig. 5, Col. 5, lines 44 – 55, The digital signature of the
digitally signed image is accessed and the hash value of the digital signature is
recovered (block 520). This may be accomplished by running the digitally signed
image through the digital signature algorithm being provided with a public key of the
signatory for decode purposes. Thereafter, the recovered hash value is compared to
the reconverted hash value (block 530)...", Hale and also see Col. 6 – 7, lines 62 – 67
and 1 – 5 , "If the matching of the identifier ...This process continues until all entries in

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[1] Wherein the prior art Zhao further discloses the physical document specifically in Col. 4 and 7, lines 33 –

the import table have corresponding entries in the BRIT...", Hale). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the Hale's teachings to the system **of** the combination of Zhao in view of Lienhart. Skilled artisan would have been motivated to do so, as suggested by Hale (Col. 5, lines 31 – 33, Hale), to verify the integrity of stored information.

Regarding Claim 2, the combination of Zhao in view of Lienhart and further in view of Hale discloses a system, further comprising a component that generates signature(s) corresponding to one or more of the generated images and generates a signature corresponding to the captured image of the physical document (Col. 4 and 5, lines 33 – 36 and 51 – 58; r4espectively, "can make the digital signature by encrypting the digest ...", Zhao), the signatures identify the word-layout of the generated images (Col. 5 and 6; lines 57 – 58 and 53 – 59; respectively, Zhao), and the search performed via comparing the signatures of the generated images with the signature of the captured image of the physical document (Col. 4 and 5, lines 33 – 36 and 59 – 65; respectively, Zhao).

Regarding Claim 3, the combination of Zhao in view of Lienhart and further in view of Hale discloses a system, the signatures being at least one of hash tables and approximate hash tables, or combination thereof (Col. 9, lines 13 – 18, Zhao).

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38 and 25 – 35; respectively.

Regarding Claim 4, the combination of Zhao in view of Lienhart and further in

view of Hale discloses a system, the at least one of the hash tables or approximate

hash tables comprising a key (Col. 4, lines 23 – 27, "a key", Zhao) that is associated

with a location and width of a word within at least one of the generated images or the

captured image of the physical document, or combination thereof (Col. 4, lines 28 – 36

and 47 – 52, Zhao[3]).

Regarding Claim 7, the combination of Zhao in view of Lienhart and further in

view of Hale discloses a system, the signature(s) corresponding to the one or more

generated images comprise a tolerance for error (Col. 13 – 14, lines 66 – 67 and 1 – 6,

Zhao).

Regarding Claim 8, the combination of Zhao in view of Lienhart and further in

view of Hale discloses a system, a portion of the signature(s) associated with the one or

more generated images is compared to a corresponding portion of the signature of the

captured image of the physical document (Col. 4 and 5, lines 33 – 36 and 59 – 65;

respectively, Zhao).

Regarding Claim 9, the combination of Zhao in view of Lienhart and further in

view of Hale discloses a system, the signature(s) corresponding to the one or more

generated images that have a threshold number of matches to the corresponding

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[2] Wherein the overlap representation implies the width of the words as claimed.

portion of the signature of the captured image of the physical document are retained for

further consideration (Col. 4 and 9, lines 33 – 36 and 56 – 62; respectively, Zhao).

Regarding Claim 11, the combination of Zhao in view of Lienhart and further in

view of Hale discloses a system, the signatures corresponding to the one or more

generated images and the signature of the captured image of the physical document

are generated at least in part upon a location of at least a portion of each word in the

generated images and the captured image of the physical document, respectively (Col.

4, lines 33 – 36 and 47 – 49, Zhao[4]).

Regarding Claim 12, the combination of Zhao in view of Lienhart and further in

view of Hale discloses a system, the signatures corresponding to the one or more

generated images and the signature of the captured image of the physical document

further generated at least in part upon a width of each word in the captured image and

the generated images, respectively (Col. 4, lines 33 – 36 and 49 – 52, Zhao[5]).

Regarding Claim 19, the combination of Zhao in view of Lienhart and further in

view of Hale discloses a system, further comprising a caching component that

automatically generates an image of an electronic document at a time such electronic

document is printed (Col. 4, lines 5 – 7, Zhao).

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[3] Wherein the order of the characters corresponds to the location claimed; and wherein the overlap representation corresponds to the width of the words claimed.
[4] Wherein the order of the characters corresponds to the location claimed.
[5] Wherein the overlap representation implies the width of the words as claimed.

Regarding Claim 20, the combination of Zhao in view of Lienhart and further in

view of Hale discloses a system, further comprising an artificial intelligence component

that infers which printed documents should have associated stored images (Col. 4, lines

5 – 10, Zhao[6]).

Regarding Claim 21, the combination of Zhao in view of Lienhart and further in

view of Hale discloses a system, further comprising an artificial intelligence component

that excludes a subset of the generated images from the search based at least in part

upon one of user state, user context, or user history (Col. 17, lines 17 – 23, Zhao[7]).

Regarding Claim 22, the combination of Zhao in view of Lienhart and further in

view of Hale discloses a system, at least one of the generated images is associated

with an entry within a data store, the entry comprising one or more of an image of a

page of an electronic document or a signature that identifies the image of the page (Col.

4, lines 23 – 27, "a key", Zhao), the signature based at least in part upon topological

properties of words within the image of the page (Col. 4, lines 28 – 31 and 47 – 52,

Zhao).

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[6] Wherein the step of producing from a specific region corresponds to the step of inferring which printed documents ... as claimed.
[7] Wherein the step including when a document could not verify himself and routing it to the proper server corresponds to the step of excluding a subset of the generated images as claimed.

Regarding Claim 25, the combination of Zhao in view of Lienhart and further in

view of Hale discloses a method that facilitates indexing and/or retrieval of a document,

comprising:

receiving a captured image of at least a portion of a document (Col. 4, lines 20 –

22, "receives the digital representation", Zhao);

searching at least one data store for an electronic document corresponding to the

captured image (Col. 4 and 19, lines 44 – 47 and 13 – 17, "the first digital document is

searched.."; respectively, Zhao), the search performed via comparing topological word

properties within the captured image with topological word properties of generated

images corresponding to a plurality of electronic documents (Col. 4, lines 28 – 38,

"compare the read first authentication information with second authentication

information", Zhao[8]), the respective topological word properties comprising at least

width of each word (Col. 4, lines 49 – 52, Zhao[9]; and Col. 10, lines 6 – 15, Lienhart);

generating signatures corresponding to the generated images, each of the

signatures is a hash table that contains a plurality of table locations where a respective

value corresponding to a respective portion of a particular generated image is entered

into a respective table location for each portion of the particular generated image (Col.

5, lines 51 – 58, "can make the digital signature by encrypting the digest ...", Zhao; and

Fig. 4, items 440-1 and 440-m, Col. 5 and 6, lines 17 – 29 and 9 – 15; respectively,

Hale); and

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[8] Wherein the security pattern that is physical part of the analog form corresponds to the topological word properties claimed.
[9] Wherein the overlap representation implies the width of the words as claimed.

generating signatures corresponding to the captured images, the signature is a

hash table that contains a plurality of table locations where a respective value

corresponding to a respective portion of the captured image is entered into a respective

table location for each portion of the captured image (Col. 5, lines 51 – 58, Zhao; and

Fig. 6, item 600-1 and 600-m, Col. 6, lines 25 – 33, Hale).

Regarding Claim 26, the combination of Zhao in view of Lienhart and further in

view of Hale discloses a method, further comprising:

comparing the signatures corresponding to the generated images with the

signature corresponding to the captured image of the document (Col. 5, lines 59 – 65,

Zhao), the signatures associated with the generated images are based at least in part

upon location and width of each word within the generated images, and the signature .

associated with the captured image is based at least in part upon location and width of

each word within the captured image (Col. 4, lines 49 – 52, Zhao; Col. 10, lines 6 – 15,

Lienhart; and Col. 4, lines 49 – 54, Hale).

Regarding Claim 33, the combination of Zhao in view of Lienhart and further in

view of Hale discloses a system for indexing and/or retrieval of a document, comprising:

means for generating an image of an electronic document when the electronic

document is printed (Col. 4, lines 5 – 7, Zhao[10]);

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[10] Wherein the prior art Zhao further discloses the printed document specifically in Col. 4 and 7, lines 33 –
38 and 25 – 35; respectively.

means for capturing an image of the document after the document has been

printed (Col. 4, lines 5 – 7, Zhao);

means for generating a signature corresponding with the generated image (Col.

5, lines 51 – 65, Zhao);

means for generating a signature corresponding with the captured image (Col. 5,

lines 51 – 65, Zhao);

means for storing the electronic document (Col. 19, lines 5 – 11, Zhao); and

means for retrieving the electronic document (Col. 4, lines 30 – 33, Zhao), the means

based at least in part upon iteratively comparing location of respective words and width

of respective words within a portion of a signature associated with the captured image

to the location of respective words and width of respective words within respective

portions of signatures associated with the generated images (Col. 4, lines 28 – 31 and

47 – 52, Zhao; and Col. 10, lines 6 – 15, Lienhart) and excluding each generated

image whose signature portion does not match the signature portion of the captured

image, the portion of the signature associated with the captured image and the

corresponding portions of the signatures respectively associated with the generated

images that are compared become progressively smaller with each iteration, where

one or more iterations are performed until a predetermined threshold number of

generated images remain (Col. 4 and 9, lines 33 – 36 and 56 – 62; respectively, Zhao;

Fig. 5, Col. 5, lines 44 – 55, The digital signature of the digitally signed image is

accessed and the hash value of the digital signature is recovered (block 520). This

may be accomplished by running the digitally signed image through the digital

signature algorithm being provided with a public key of the signatory for decode

purposes. Thereafter, the recovered hash value is compared to the reconverted hash

value (block 530)...", Hale and also see Col. 6 – 7, lines 62 – 67 and 1 – 5 , "If the

matching of the identifier ...This process continues until all entries in the import table

have corresponding entries in the BRIT...", Hale).

Regarding Claim 34, the combination of Zhao in view of Lienhart and further in

view of Hale discloses a system, further comprising:

means for generating a signature that includes features that are highly specific to

the generated image (Col. 5, and 10 – 11, lines 51 – 58, and 64 – 67 and 1 – 5;

respectively, Zhao); and

means for generating a signature corresponding to the captured image, the

signature includes features that are highly specific to the captured image (Col. 5, and 10

– 11, lines 51 – 58, and 64 – 67 and 1 – 5; respectively, Zhao).

Regarding Claim 35, the combination of Zhao in view of Lienhart and further in

view of Hale discloses a system, further comprising means for comparing the signature

corresponding to the generated image with the signature corresponding to the captured

image (Col. 5, lines 59 – 65, Zhao).

Regarding Claim 36, the combination of Zhao in view of Lienhart and further in

view of Hale discloses a system, further comprising means for accounting for error that

occurs when capturing the image of the printed document (Col. 13 – 14, lines 66 – 67 and 1 – 6, Zhao).

Regarding Claim 38, the combination of Zhao in view of Lienhart and further in view of Hale discloses a system that facilitates indexing and/or retrieval of a document, comprising:

a query component that receives an image of a printed document (Col. 4 and 17, lines 20 – 22 and 49 – 50, query interface; respectively, Zhao[11]);

a caching component that generates and stores an image corresponding to the image of the printed document prior to the query component receiving the image of the printed document (Col. 4 and 17, lines 5 – 7 and 49 – 50, database 729; respectively, Zhao); and

a comparison component that retrieves the stored image via comparing location of words and width of words within the stored image to location of words and width of words within the image of the printed document (Col. 4 and 17, lines 28 – 31 and 47 – 52, and 52 – 55, comparator 517; respectively, Zhao[12]), the comparison component iteratively compares a portion of a signature associated with the received image with portions of signatures respectively associated with the stored images and excludes each stored image whose signature does not match the signature of the received image, the portion of the signature associated with the received image and the portion

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[11] Wherein the prior art Zhao further discloses the printed document specifically in Col. 4 and 7, lines 33 – 38 and 25 – 35; respectively.
[12] Wherein the order of the characters corresponds to the location claimed; and wherein the overlap representation corresponds to the width of the words claimed.

of the signatures respectively associated with the stored images that are compared

become progressively smaller with each iteration, where one or more iterations are

performed until a predetermined threshold number of signatures associated with the

stored images remain (Col. 4 and 9, lines 33 – 36 and 56 – 62; respectively, Zhao; Fig.

5, Col. 5, lines 44 – 55, The digital signature of the digitally signed image is accessed

and the hash value of the digital signature is recovered (block 520). This may be

accomplished by running the digitally signed image through the digital signature

algorithm being provided with a public key of the signatory for decode purposes.

Thereafter, the recovered hash value is compared to the reconverted hash value (block

530)...", Hale and also see Col. 6 – 7, lines 62 – 67 and 1 – 5 , "If the matching of the

identifier ...This process continues until all entries in the import table have

corresponding entries in the BRIT...", Hale).

Regarding Claim 39, the combination of Zhao in view of Lienhart and further in

view of Hale discloses a computer readable medium having computer executable

instructions stored thereon to return stored image of an electronic document to a user

based at least in part upon topological word properties of at least one of captured image

corresponding to the electronic document (Col. 4 and 17, lines 28 – 31 and 47 – 52, and

55 – 57, network server 719, Zhao) and an iterative comparison of a portion of a signature

associated with the at least one captured image with portions of signatures respectively

associated with the at least one stored image and excludes each stored image whose

signature does not match the signature of the at least one captured image, the portion

of the signature associated with the at least one captured image and the portion of the

signatures respectively associated with the at least one stored image that are compared

become progressively smaller with each iteration, where one or more iterations are

performed until a predetermined threshold number of signatures associated with the at

least one stored image remains (Col. 4 and 9, lines 33 – 36 and 56 – 62; respectively,

Zhao; Fig. 5, Col. 5, lines 44 – 55, The digital signature of the digitally signed image is

accessed and the hash value of the digital signature is recovered (block 520). This may

be accomplished by running the digitally signed image through the digital signature

algorithm being provided with a public key of the signatory for decode purposes.

Thereafter, the recovered hash value is compared to the reconverted hash value (block

530)...", Hale and also see Col. 6 – 7, lines 62 – 67 and 1 – 5 , "If the matching of the

identifier ...This process continues until all entries in the import table have

corresponding entries in the BRIT...", Hale), wherein the topological word properties

comprise at least width of respective words (Col. 4, lines 49 – 52, Zhao[13]; and Col. 10,

lines 6 – 15, Lienhart).

        Regarding Claim 40, the combination of Zhao in view of Lienhart and further in

view of Hale discloses a computer readable medium having a data structure thereon,

the data structure comprising:

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[13] Wherein the overlap representation implies the width of the words as claimed.

a component that receives image(s) of at least a portion of a printed document (Col. 4, lines 20 – 22, "receives the digital representation", Zhao[14]);

a search component that facilitates retrieval of an electronic document (Col. 4, lines 44 – 47, "the first digital document is searched..", Zhao), the electronic document corresponding to the image(s) associated with the printed document, the retrieval based at least in part upon corresponding word-level topological properties when comparing the image(s) associated with the printed document and generated image(s) of the electronic document (Col. 4, lines 28 – 31 and 47 – 52, Zhao), the word-level topological properties comprise at least width of words (Col. 4, lines 49 – 52, Zhao[15]; and Col. 10, lines 6 – 15, Lienhart); and

a comparison component that is associated with the search component and iteratively compares a portion of a signature associated with the image associated with the printed document with portions of signatures respectively associated with the generated images and excludes each generated image whose signature does not match the signature of the image associated with the printed document, the portion of the signature associated with the image associated with the printed document and the portion of the signatures respectively associated with the generated images that are compared become progressively smaller with each iteration, where one or more iterations are performed until a predetermined threshold number of signatures associated with generated images remain (Col. 4 and 9, lines 33 – 36 and 56 – 62;

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[14] Wherein the prior art Zhao further discloses the printed document specifically in Col. 4 and 7, lines 33 – 38 and 25 – 35; respectively.
[15] Wherein the overlap representation implies the width of the words as claimed.

respectively, Zhao; Fig. 5, Col. 5, lines 44 – 55, The digital signature of the digitally

signed image is accessed and the hash value of the digital signature is recovered (block

520). This may be accomplished by running the digitally signed image through the

digital signature algorithm being provided with a public key of the signatory for decode

purposes. Thereafter, the recovered hash value is compared to the reconverted hash

value (block 530)...", Hale and also see Col. 6 – 7, lines 62 – 67 and 1 – 5 , "If the

matching of the identifier ...This process continues until all entries in the import table

have corresponding entries in the BRIT...", Hale).

Regarding Claim 42, the combination of Zhao in view of Lienhart and further in

view of Hale discloses a signal having one or more data packets that facilitate indexing

and/or retrieval of a document, comprising:

a request for retrieval of a stored image of at least a portion of an electronic

document (Col. 4, lines 31 – 33, Zhao);

a signature of an electronic image of a printed document corresponding to a

signature of the requested stored image associated with of the electronic document, the

signatures based at least in part upon word layout of the images (Col. 5, lines 51 – 56,

"the digital signature for the digital representation", Zhao), the signature of the electronic

image is a hash table that contains a plurality of table locations where a respective

value corresponding to a respective segment of the electronic image is entered into a

respective table location for each segment of the electronic image, and the signature of

the requested stored image is a hash table that contains a plurality of table locations

where a respective value corresponding to a respective segment of the requested

stored image is entered into a respective table location for each segment of the

requested stored image (Fig. 4, items 440-1 and 440-m, Col. 5 and 6, lines 17 – 29 and

9 – 15; respectively, Hale); and

a component that facilitates comparison of the signature of the electronic image

of the printed document with the signature of the requested stored image associated

with the electronic document (Col. 4, lines 28 – 31 and 47 – 52, Zhao).

8.   Claims 5 – 6, 10, and 24 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Zhao (US Patent No. 6,487,301 B1, issued: November 26, 2004), in

view of Lienhart et al. (Lienhart hereinafter) (US 6,470,094), in view of Hale et al. (Hale

hereinafter) (US 6,928,548), and further in view of Ming Ye et al. (Ye hereinafter) (Non-

Patent Literature: "Document Image Matching and Annotation Lifting", 2001 IEEE).

Regarding Claim 5, the combination of Zhao in view of Lienhart and further in

view of Hale discloses all the limitations as disclosed above including generated images

all the limitations as disclosed above including generated images. However, the

combination of Zhao in view of Lienhart and further in view of Hale is silent with respect

to confidence score. On the other hand, Ye discloses a scoring component that assigns

confidence scores corresponding to a subset of the generated images that are searched

against (Page 2, Section 2., Matching Score, "the matching score ...", Ye). It would

have been obvious to one of ordinary skill in the art at the time the invention was made

to incorporate the Ye's teachings to the systemof the combination of Zhao in view of

Lienhart and further in view of Hale. Skilled artisan would have been motivated to do so,

as suggested by Ye (Page 2, Section 2., Matching Score, Ye), to minimize the

interference of possible annotations.

Regarding Claim 6, the combination of Zhao in view of Lienhart in view of Hale

and further in view of Ye discloses a system, a generated image with the highest

confidence score is selected as the match to the captured image of the document (Page

4, Section 4, "Line Tracing Protocol", proximity measure ... with the highest score", Ye).

Regarding Claim 10, the combination of Zhao in view of Lienhart in view of Hale

and further in view of Ye discloses a system, further comprising a component that

assigns confidence scores when a threshold number of signatures are being retained

for further consideration (Page 2, Section 2., Matching Score, "the matching score ...",

Ye).

Regarding Claim 24, the combination of Zhao in view of Lienhart and further in

view of Hale discloses a method that facilitates indexing and/or retrieval of a document,

comprising:

generating a plurality of images of electronic documents, at least one of the

images of electronic documents corresponding to a printed document (Col. 4, lines 5 –

7, Zhao[16]);

capturing an image of a printed document after such document has been printed

(Col. 4, lines 20 – 22, "receives the digital representation", Zhao);

receiving a query requesting retrieval of an electronic document corresponding to

the image of the printed document (Col. 4, lines 30 – 33, Zhao);

generating one or more signatures corresponding to at least a portion of one or

more of the generated images, the signatures generated at least in part upon word-

layout within the image(s) (Col. 5, lines 51 – 58, "can make the digital signature by

encrypting the digest ...", Zhao), the one or more signatures is a hash table that

contains a plurality of table locations where a respective value corresponding to a

respective segment of the generated image is entered into a respective table location

for each segment of generated image (Fig. 4, items 440-1 and 440-m, Col. 5 and 6,

lines 17 – 29 and 9 – 15; respectively, Hale);

generating a signature corresponding to at least a portion of the captured image,

the signature is generated based at least in part upon word-layout within the captured

image (Col. 5 and 11, lines 51 – 62 and 44 – 51; respectively, "... use a scanner to

detect the digital signature (i.e. card number or other ID) from the card, and compare

the signature with the authentication stored inside the card ..."; Zhao), the signature is a

hash table that contains a plurality of table locations where a respective value

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[16] Wherein the prior art Zhao further discloses the printed document specifically in Col. 4 and 7, lines 33 ÷

corresponding to a respective segment of the captured image is entered into a respective table location for each segment of the captured image (Fig. 6, item 600-1 and 600-m, Col. 6, lines 25 – 33, Hale);

comparing the one or more signatures corresponding to the one or more generated images to the signature corresponding to the captured image (Col. 5, lines 59 – 65, Zhao); and

Furthermore, the combination of Zhao in view of Lienhart and further in view of Hale also discloses a identifying a generated image that has a number of table locations that have respective values that match values in corresponding table locations associated with the captured image. However, the combination of Zhao in view of Lienhart and further in view of Hale does not explicitly disclose that: identifying a generated image that has a highest number. On the other hand, Ye discloses system and apparatus similar to the combination of Zhao in view of Lienhart and further in view of Hale including: identifying a generated image that has a highest number (Page 4, section: 4, 4th paragraph in that section, "...we examine the one with the highest score, and accept it if its score is sufficiently high). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the Ye's teachings to the system of the combination of Zhao in view of Lienhart and further in view of Hale. Skilled artisan would have been motivated to do so, as suggested by Ye (page 4, section 6: Conclusions, 1sth paragraph in that section, Ye), to provide document authentication and duplicate detection.

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38 and 25 – 35; respectively.

9.   Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhao

(US Patent No. 6,487,301 B1, issued: November 26, 2004), in view of Lienhart et al.

(Lienhart hereinafter) (US 6,470,094), in view of Hale et al. (Hale hereinafter) (US

6,928,548), and further in view of Bresler et al. (Bresler hereinafter) (US Patent App.

Pub. No. 2003/0152293 A1, filed: January 24, 2003).

        Regarding Claim 41, the combination of Zhao in view of Lienhart and further in

view of Hale discloses all the limitations as disclosed above. However, the combination

of Zhao in view of Lienhart and further in view of Hale is silent with respect to personal

digital assistant. On the other hand, Bresler discloses a personal digital assistant (Fig.

8, Page 8, [0149], lines 5 – 7, Bresler). It would have been obvious to one of ordinary

skill in the art at the time the invention was made to incorporate the Bresler's teachings

to the system of the combination of Zhao in view of Lienhart and further in view of Hale.

Skilled artisan would have been motivated to do so, as suggested by Bresler (Page 7,

[0146], lines 1 – 6, Bresler), to provide an imager-enabler device, either stand-alone or

connected via a wireless network.

10.   Claims 13, 23, 27, 29, and 37 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Zhao (US Patent No. 6,487,301 B1, issued: November 26, 2004), in

view of Lienhart et al. (Lienhart hereinafter) (US 6,470,094), in view of Hale et al. (Hale

hereinafter) (US 6,928,548), and further in view of Shin-Ywan Wang et al. (Wang

hereinafter) (Non-Patent Literature: "Block Selection: A Method for Segmenting Page

Image of Various Editing Styles", Canon Information Systems, 1995 IEEE).

Regarding Claim 13, the combination of Zhao in view of Lienhart and further in

view of Hale discloses all the limitations as disclosed above including generated images

and captured image of the physical documents. However, the combination of Zhao in

view of Lienhart and further in view of Hale is silent with respect to trees. On the other

hand, Wang discloses: a component that generates at least one tree representation

related to the generated images and the captured image of the physical document, the

at least one tree representation being a hierarchical representation of the generated

images and the captured image of the physical document, wherein the at least one tree

representation conveys which segments of the generated images and which segments

of the captured image of the physical document include a word (Page 128, "which

segments the page image and converts it into another computer readable format – a

hierarchical tree description form which the page content arrangement can be realized.

Each node on the tree maps to an object on the page ...", Wang). It would have been

obvious to one of ordinary skill in the art at the time the invention was made to

incorporate the Wang's teachings to the system of the combination of Zhao in view of

Lienhart and further in view of Hale. Skilled artisan would have been motivated to do so,

as suggested by Wang (Page 1 and 133, "Abstract" and "Conclusion", Wang), to

provide categorized page blocks for easy selection, to generate a robust result but also, and to expand to broader document image processing applications.

Furthermore, the combination of Zhao in view of Lienhart in view of Hale and further in view of Wang discloses: a comparison component that compares a tree representation related to the generated images with the tree representation related to the captured image of the physical document (Col. 4, lines 28 – 38, "compare the read first authentication information with second authentication information", Zhao; and Page 128, Abstract, Wang).

Regarding Claim 23, the combination of Zhao in view of Lienhart in view of Hale and further in view of Wang discloses a system, the one or more of the image of the page of the electronic document or the signature that identifies the image of the page associated with one or more of a URL that identifies a location of the electronic document (Col. 17, lines 17 – 19, Zhao), the electronic document (Col. 4, lines 47 – 49, "first digital document", Zhao), a hierarchical tree representation of the image of the page of the electronic document (Page 128, Abstract, Wang), OCR of the image of the page (Col. 4, lines 39 – 44, Zhao), data relating to a number of times the image of the page has been accessed, customer records (Col. 15, lines 43 – 46, Zhao), payment information (Col. 15, lines 12 – 14, Zhao), and workflow information (Col. 18, lines 53 – 58, Zhao), or combination thereof.

Regarding Claim 27, the combination of Zhao in view of Lienhart in view of Hale

and further in view of Wang discloses a method, further comprising:

partitioning the captured image of the document into a plurality of segments

(Page 128, Abstract, "page segmentation method called block selection which not only

segments the page image ...", Wang);

partitioning the generated images into segments corresponding to the segments

of the captured image of the document (Page 129, "the blocks with certain logic

relationship are liked as parent-child nodes", Wang); and

comparing the word layout of the captured image of the document with the word

layout of the generated images only within corresponding segments of the captured

image of the document and the images within the data store(s) (Col. 5, lines 59 – 65,

Zhao).

Regarding Claim 29, the combination of Zhao in view of Lienhart in view of Hale

and further in view of Wang discloses a method, further comprising:

partitioning the captured image of the document to create a hierarchy of

segments (Page 128, Abstract, "the formed blocks are described by a hierarchical tree

to reflect the page arrangement ...", Wang);

partitioning the generated images to create a hierarchy of segments

corresponding to the hierarchy of segments related to the captured image of the

document (Page 129, "the blocks with certain logic relationship are liked as parent-child

nodes", Wang);

assigning the segments in the captured image of the documents and the

segments in the generated images a first value when the segments comprise a word

(Page 129, Section 2.1, "... a size threshold is figured to classify the connected

components into text ...", Wang);

assigning the segments in the captured image of the documents and the

segments in the generated images a second value when the segments do not comprise

a word (Page 129, Section 2.1, "... a size threshold is figured to classify the connected

components into text and nontext", Wang);

comparing the hierarchy of segments (Col. 5, lines 59 – 65, Zhao); and

removing one or more generated images from consideration when a segment

associated with the one or more generated images assigned the second value and a

corresponding segment associated with the captured image of the document is

assigned the first value (Page 129, Section 2.1, "are filtered out as nontext

components...", Wang).

Regarding Claim 37, the combination of Zhao in view of Lienhart in view of Hale

and further in view of Wang discloses a system, further comprising:

means for partitioning the generated image into a plurality of segments (Page

128, Abstract, "the formed blocks are described by a hierarchical tree to reflect the page

arrangement ...", Wang);

means for partitioning the captured image into a plurality of segments (Page 129,

1. Introduction, "the blocks with certain logic relationship are liked as parent-child

nodes", Wang) where each segment corresponds to respective segments associated with the generated image (Page 131, 2.6 Formation of text blocks, "the closeness between text units is based on the statistical analysis of horizontal and vertical gaps between neighboring text units of the same tree level ...", Wang); and

means for comparing a segment of the stored image with a corresponding segment of the captured image (Col. 5, lines 59 – 65, Zhao).

11.   Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhao (US Patent No. 6,487,301 B1, issued: November 26, 2004), in view of Lienhart et al. (Lienhart hereinafter) (US 6,470,094), in view of Hale et al. (Hale hereinafter) (US 6,928,548), in view of Shin-Ywan Wang et al. (Wang hereinafter) (Non-Patent Literature: "Block Selection: A Method for Segmenting Page Image of Various Editing Styles", Canon Information Systems, 1995 IEEE), and further in view of Ming Ye et al. (Ye hereinafter) (Non-Patent Literature: "Document Image Matching and Annotation Lifting", 2001 IEEE).

Regarding Claim 28, the combination of Zhao in view of Lienhart in view of Hale and further in view of Wang discloses all the limitations as disclosed above including: generated images based at least in part upon a correspondence between the word layout of the captured image and the word layout of the generated images (Col. 9, lines 56 – 62, Zhao). However, the combination of Zhao in view of Lienhart in view of Hale and further in view of Wang is silent with respect to assigning confidence scores. On the

other hand, Ye discloses confidence scores (Page 2, Section 2., Matching Score, "the

matching score ...", Ye). It would have been obvious to one of ordinary skill in the art at

the time the invention was made to incorporate the Ye's teachings to the system of the

combination of Zhao in view of Lienhart in view of Hale and further in view of Wang.

Skilled artisan would have been motivated to do so, as suggested by Ye (Page 2,

Section 2., Matching Score, Ye), to minimize the interference of possible annotations.

12.   Claims 14 – 18, and30 – 32 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Zhao (US Patent No. 6,487,301 B1, issued: November 26, 2004), in

view of Lienhart et al. (Lienhart hereinafter) (US 6,470,094), in view of Hale et al. (Hale

hereinafter) (US 6,928,548), and further in view of Bloomberg (US Patent No.

5,181,255, issued: January 19, 1993).

        Regarding Claim 14, the combination of Zhao in view of Lienhart and further in

view of Hale discloses all the limitations as disclosed above including captured images

of the physical documents. However, the combination of Zhao in view of Lienhart and

further in view of Hale is silent with respect to reducing noise. On the other hand,

Bloomberg discloses: a component that reduces noise in the captured image of the

physical document (Col. 6, lines 55 – 57, Bloomberg). It would have been obvious to

one of ordinary skill in the art at the time the invention was made to incorporate the

Bloomberg's teachings to the system of the combination of Zhao in view of Lienhart and

further in view of Hale. Skilled artisan would have been motivated to do so, as

suggested by Bloomberg (Col. 6, lines 45 – 55, Bloomberg), to provide reduced scale

operations since reduced scale operations operate in an efficient manner and more

readily segregate handwritten and machine printed text.

Regarding Claim 15, the combination of Zhao in view of Lienhart in view of Hale

and further in view of Bloomberg discloses a system, further comprising a component

that generates a grayscale image of the captured image of the physical document (Col.

4, lines 33 – 36, Zhao; and Col. 4, lines 42 – 44, Bloomberg).

Regarding Claim 16, the combination of Zhao in view of Lienhart in view of Hale

and further in view of Bloomberg discloses a system, further comprising a connecting

component that connects characters within a word of the generated images and the

captured image without connecting words of the generated images and the captured

image (Col. 4, lines 25 – 28, Bloomberg[17]).

Regarding Claim 17, the combination of Zhao in view of Lienhart in view of Hale

and further in view of Bloomberg discloses a system, the generated images and the

captured image being binary images, the connecting component performs a pixel

dilation of the binary images (Col. 5, lines 1 – 7, Bloomberg).

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[17] Wherein the letters corresponds to the characters within a word as claimed.

Regarding Claim 18, the combination of Zhao in view of Lienhart in view of Hale and further in view of Bloomberg discloses a system, the connecting component alters resolution of the captured image of the physical document to facilitate connecting characters within a word of the captured image of the physical document without connecting disparate words within the captured image of the physical document (Col. 4, lines 33 – 36, Zhao; and Col. 4 and 9, lines 25 – 28 and 41 – 44; respectively, Bloomberg[18]).

Regarding Claim 30, the combination of Zhao in view of Lienhart in view of Hale and further in view of Bloomberg discloses a method, further comprising reducing noise in the captured image of the document prior to searching the data store(s) (Col. 6, lines 55 – 57, Bloomberg).

Regarding Claim 31, the combination of Zhao in view of Lienhart in view of Hale and further in view of Bloomberg discloses a method, wherein reducing noise comprises one or more of:

providing a filter that removes markings that have a width greater than a threshold width (Col. 8, lines 16 – 20, "horizontal SE (e.g. 15h)...", Bloomberg);

providing a filter that removes markings with a width less than a threshold width (Col. 8, lines 16 – 20, "horizontal SE (e.g. 10h)...", Bloomberg);

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[18] Wherein the letters corresponds to the characters within a word as claimed.

providing a filter that removes markings with a height greater than a threshold height (Col. 8, lines 23 – 28, Bloomberg); and

providing a filter that removes marking with a height less than a threshold height (Col. 8, lines 23 – 28, "removes any small vertical "filaments" ...", Bloomberg).

Regarding Claim 32, the combination of Zhao in view of Lienhart in view of Hale and further in view of Bloomberg discloses a method, further comprising generating a grayscale image of the captured image of the document prior to searching the data store(s) (Col. 4, lines 42 – 44, Bloomberg).

Prior Art Made Of Record

1.   Zhao (US Patent No. 6,487,301 B1, issued: November 26, 2004)

2.   Shin-Ywan Wang et al. (Non-Patent Literature: "Block Selection: A Method for

Segmenting Page Image of Various Editing Styles", Canon Information Systems, 1995

IEEE).

3.   Bloomberg (US Patent No. 5,181,255, issued: January 19, 1993).

4.   Bresler et al. (US Patent App. Pub. No. 2003/0152293 A1, filed: January 24,

2003)

5.   Ming Ye et al. (Non-Patent Literature: "Document Image Matching and

Annotation Lifting", 2001 IEEE).

6.   Lienhart et al. (US 6,470,094).

7.   Hale et al. (Hale hereinafter) (US 6,928,548).

Points Of Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Giovanna Colan whose telephone number is (571) 272-2752. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached on (571) 272-4107. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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